

Preliminary Study and Proposal for Restoring A Jesuit College at Saragossa, Spain

Rosa Bustamante, Benito Lauret, Juan Monjo and J.M. Valero
School of Architecture, Polytechnic University of Madrid, Spain

ABSTRACT: A historical study and a construction pathology survey were conducted prior to proposing a solution for restoring the upper windows on the south side of Old San Carlos College at Saragossa (16th-17th centuries), which had been forfeited to add a third storey to the cloister. Although initially designed to a simple large hall format, the church is a harmonious blend of Aragonese Gothic architecture and the typical Jesuit scheme, consisting in a central nave flanked by chapel-confessionals and raised galleries for the community. A subsequent enlargement of the roof, which rests on the original framing over the central nave, reduced the mechanical strength of the principal rafters on the opposite side, prompting a concomitant imbalance of forces that has affected the entire structure. In view of the foregoing, in addition to restituting the upper windows, the proposed solution envisages restoring the roof over the central nave to its original design, and with it the interior lighting in the church.

1 HISTORICAL STUDY

1.1 *San Carlos College at Saragossa*

The idea to found San Carlos College, attributed to St Francis of Borja (Torralba 1952), did not receive support from the contemporary Archbishop, for its construction was viewed with misgivings by the other religious orders that had been active in the city for several years. Nonetheless, in 1554 the Jesuits purchased buildings in the Jewish quarter, empty since their dwellers had been expelled, and albeit with some difficulty settled there in 1555, converting Our Lady of Bethlehem synagogue into a church. By 1567, the growth of the congregation had created the need for the present church, whose cornerstone was laid in 1569.

Apparently, the Company intended to build two compounds in the city: a college and a rectory, according to the sketch by the then Jesuit Father General dated circa 1603 (Valléry-Radot 1970). That sketch of the city of Saragossa, with its early 17th C. streets and buildings, shows the location of the *Company College* on its current site and the planned location of the *rectory*, which was never built, near Main Street.

In addition to the obvious difference between civil and sacred buildings in Jesuit architecture, this sketch clearly distinguished various types of buildings depending on their purpose: the rectory, college, pupils' dormitories, novices' (third year pupils') homes, residences or small dwellings, Retreat (ancillary buildings in large colleges) and villas. The characteristics of some of these buildings are described below:

The rectory (*domus profesa*) was a home for the apostolic clergy who relied on charity for their sustenance, as well as the headquarters for the provincial leader and his closest aides; the space reserved for the cloister, refectory, meeting halls and sacristy were arranged around an interior courtyard. The church fulfilled the most important purpose. Fifty members of the order,

all living on alms, were known to live there in 1579 (Saragossa Municipal Archives: 1579, cited by Boloqui).

Colleges were hubs of educational activity, and the most prestigious included seminaries. They were characterized by the breadth of their corridors and stairways: the stairway in San Carlos, for instance, is roofed by the only dome in the compound. Central courtyards had open arcades. They constituted an independent unit – in Saragossa, bound by streets on all four sides– with the church built off of one of the angles or corners. At San Carlos, the church is sited on one side of the city block, on the corner of San Jorge Street; the facade overlooks San Carlos Square, the cloister is located in the middle and the ancillary buildings on the opposite side, pursuant to the Jesuit model. In 1770, after the order was expelled and the compound temporarily abandoned, it was occupied by the newly created Royal Seminary for Late-Life Vocations.

The earliest Jesuits built *hall churches* (Antonio da Sangallo: early fifteenth century), consisting in a single large assembly hall with a row of chapels along each side, diversely connected to the central space. The high altar was placed in a large chapel that also served as a presbytery. Such a layout tends to highlight the central hall, fostering participation in common services and breaking with the custom of prior ages in which churches were places for private worship.

1.2 Development of the constructional premises for the church

While the oldest known drawing of the college (Valléry-Radot 1979), for the “first storey of the building”, dates from some time during the first century in the life of the compound, before the changes introduced on the occasion of the 1671 fire (Boloqui 2001), the hull of the church, excluding the tower, choir and sacristy, was completed by 1585 (Braun 1913). Of the several hypotheses about the evolution of the religious compound that may be gleaned from an analysis of this drawing (Fig. 1), only those relating to the church, the subject of this study, are enumerated:

- the *hall church* is an austere proposal designed during the first phase of construction, conditioned by financial considerations and an overly literal interpretation of the texts authored by Company founders;

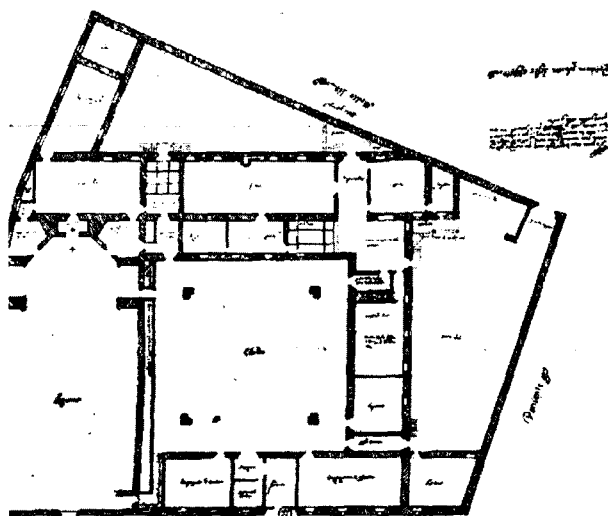


Figure 1 : First storey of San Carlos College, Saragossa, c. 1600 (Valléry-Radot), published in Saragossa at the time (Baltasar Gracián: 2001). Legend: 0 entrance; 1 Congregation of Knights; 2 Congregation of Schools; 3 latrines; 4 regular door; 5 pantry; 6 parlour; 7 refectory; 8 sacristy; 9 area “the way out to say mass”; 10 antesacristy; 11 latrines; 12 kitchen; 13 washroom; 14 stairway; 15 *de profundis*; 16 vegetable garden.

- the absence of side chapels, and therefore of columns and buttresses, confirms the preceding hypothesis (the dimensions given on the drawing in Aragonese yards are similar to the size of the present church, with a span between supports of approximately 21 m);
- as the two chapels at the head of the church form a transept, symmetry was maintained in the church design by creating polygonal areas, two antesacristies "*the way out to say mass*";
- while the drawing shows the sacristy perpendicular to the centreline of the church, it is actually perpendicular to San Jorge Street (Fig. 2); the explanation for this digression from the Jesuit model may be found in that the present sacristy, a vaulted polychrome nave with arch ribs, was built in part of a former Jewish castle, where, to make the most of the existing structure, the Jesuit monogram had to be tilted. And indeed, the oldest remains in the compound are located behind the church apse (Valero 2005), as attested for instance, by part of a walled-up ogee arch visible on the southeast buttress at the head of the church;
- the corridor to the upper choir confirms the inclusion of this element, but not of the portico at the entrance;
- due to the separation between the epistle (south) side and the cloister for men's and women's confessionals, the vaults over the latter had to be braced by columns detached from the epistle wall (see Fig. 2).

San Carlos Church measures 35.50 x 20.50 m, including the side chapels; the central nave measures 31.50 m x 12.80 m, the head is 3 m deep and the portico at the entrance is 4 m long. The cloister was built after the structure that encloses the courtyard (ancillary premises and cells); the final phase, after the compound was converted for use as a Royal Seminary, was the construction of the third storey and the concomitant extension of the church roof over the cloister, as shown in Fig. 3. By way of comparison, the San Marcos Royal Clergy Residence at Salamanca, the largest Spanish Jesuit church, measures 52 m x 29.50 m.

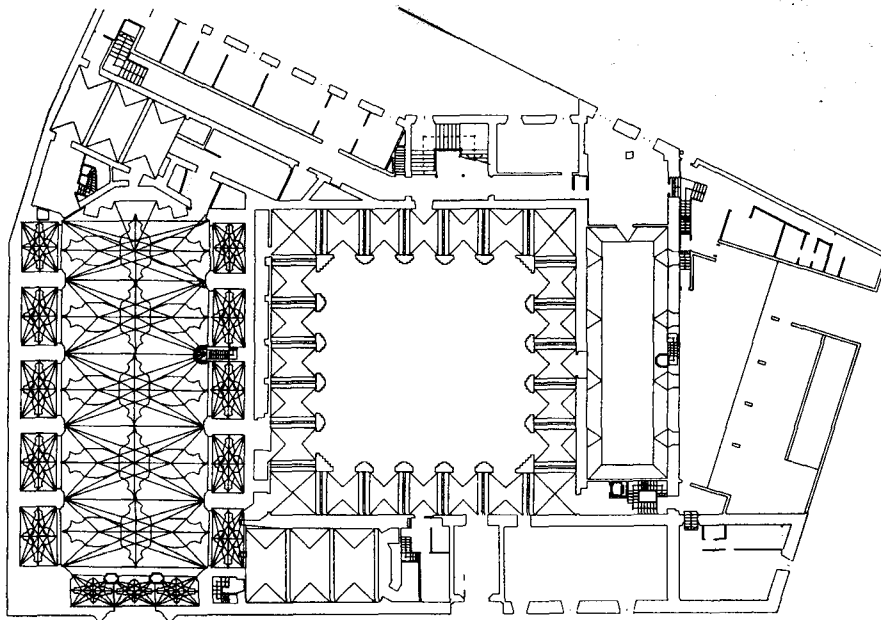


Figure 2 : Present plan view of San Carlos College at Saragossa. Church on one side of the block (San Jorge Street), cloister in the middle and other ancillary buildings to the south of the church.

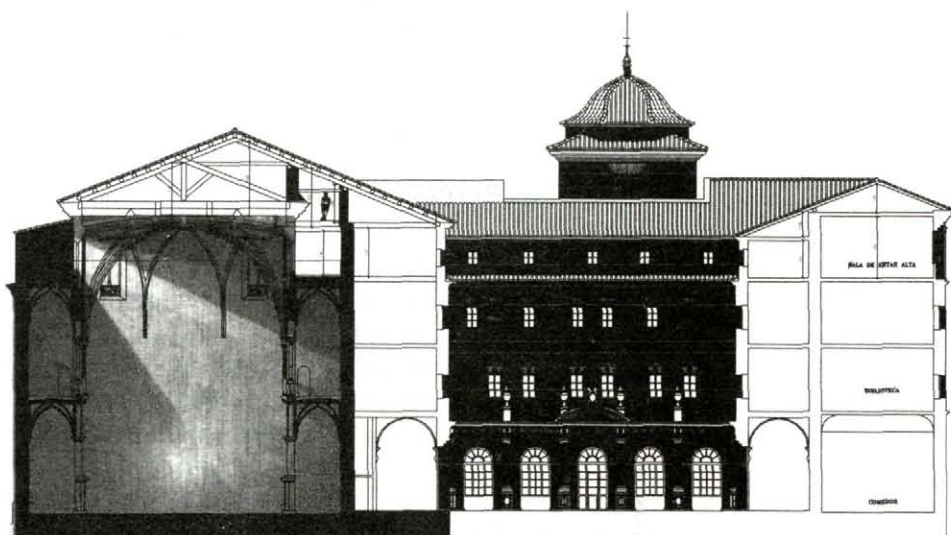


Figure 3 : Cross-section of the compound. Detail of the enlargement of the original roof and present state of interior lighting

1.3 Respect for building tradition

The Jesuits did not establish a characteristic style anywhere. On the contrary, they adapted to local tradition: in this case, Aragonese Gothic style in a city where walls, columns, vaults, floors and roofs were built of brick and flagstone; dados and sculptural decoration of gypsum rock and tile, alternating with Italian stuccos; foundations, bases and frontispieces of quarry stone; and carvings of black Calatorao stone and wood rafted to the city on the Ebro River.

The late Gothic stellar vaults that cover the naves of the church are made of a double layer of 12-cm brick embellished with gauged brick ribs for the decorative design. The tie beams in the roof framing, with a section of 22x28 cm, rest on vat-shaped structures comprising bridge beams and braces, in turn supported by the abutments from which the side chapel vaults spring.

On the occasion of the third storey enlargement, brick posts had to be erected on the original cornice (see Fig. 3), which is presently concealed by the roof, to support the extension of the roof over the south side of the central nave. Measuring 1 m high, this cornice, is similar to the one in the apse. From bottom up it consists of a quarter round, a cyma-recta, triglyphs alternating with tiny arches and another cyma-recta, all made of gauged brick and topped with two corbelled courses of brick.

1.4 Contrasts in the interior lighting

Their use of church architecture based on a central nave and darker lateral chapels reveals the Jesuits' neo-Gothic taste for the stark contrast between a central nave bathed in the light provided by large windows and scantily illuminated side chapels. In San Carlos the chapels are barely 3 m deep by 5 m wide and are only interconnected through and illuminated by the central nave, for the confessionals preclude any connections between chapels. The galleries located above the chapels, reserved for the members of the community participating in religious rites, also receive very little natural lighting due to the lattices that separate them from the central nave. The positioning of galleries over top of confessionals was a reiterative scheme in Jesuit churches, for both were areas with deliberately subdued lighting.

The central nave of San Carlos Church presently receives very little natural light as a result of the enlargement built, depending on the source, either in the nineteenth (Torralba) or the twentieth (Boloqui) century. In any event, it has deprived the church of its lighting.

As there is a wealth of widely varied literature on the redecorating done in the church, little need be added about the splendid San Carlos interiors and their importance in the history of Aragonese Baroque art. This work, begun in St Joseph's Chapel in 1692, was a reflection of the prevailing trend in the mother church. Such trends must have also influenced the new decoration

initiated by Brother Pablo Diego de Lacarre in 1723, in which the lustre on the vividly coloured stucco walls and the gilding on the wood reredos were extended to all the other constructional and decorative elements. Brother Lacarre's lavish interiors contrast with the austerity of the facade (Fig. 4).

1.5 Justification based on interpretational analysis

San Carlos is a Jesuit hall model church that evolved during construction into a central nave model with side chapels. The much lower elevation of the ceilings on the latter is emphasized by the predominance of the roof over the central nave. This is one of the more valuable features of the church and forms a part of the construction completed before the Jesuits were expelled. Moreover, the restoration of the original roof over the central nave is fully justified by the configuration of the roof reinforcement discussed below and the cornice on the south facade. Finally, the blinding of the upper windows on the south side has altered the contrast intended in the original design between a brightly lit centre and dim side chapels.

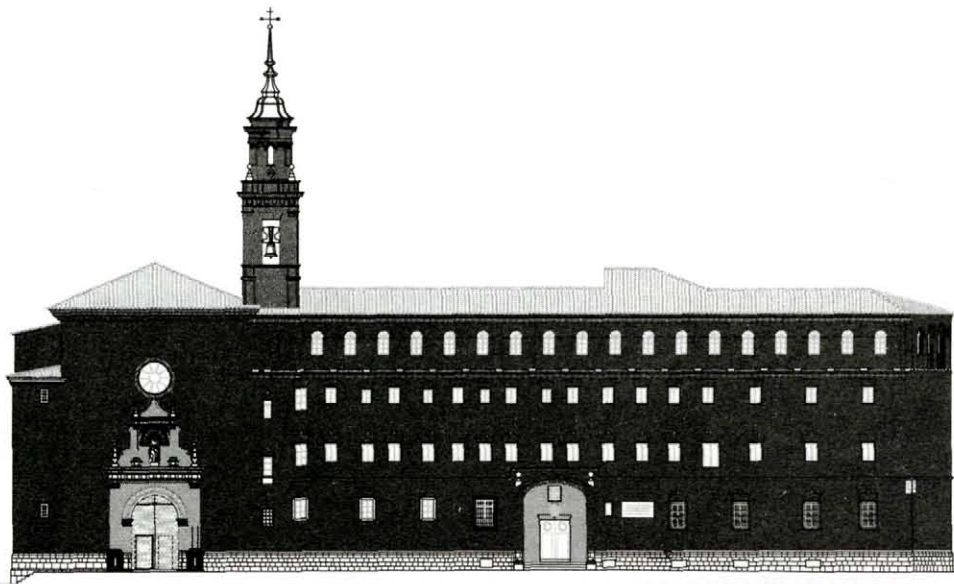


Figure 4 : Church frontispiece and proposed restitution of the original roof.
To the right facade of the third storey enlargement to San Carlos Square.

2 PATHOLOGICAL SURVEY

2.1 Church roof

2.1.1 Structural members: condition

The wood structure is in generally good condition. The members are mostly straight and free of any major flaws, with the exception of the tie beams in the Spanish trusses, whose upper side is slightly deteriorated due to the acid from pigeon excrement and xylophage attack, although neither has caused any significant decline in the effective cross-section.

Other minor damage includes:

- Partial buckling of some of the principal rafters on the gospel side, intensified by the additional compression force transmitted to the structure as a result of enlarging the roof.
- Breakage of some of the purlins and deformation of others in the same area, generally associated with leaks; some 30% of these members are estimated to be impacted.
- Damp stains denoting leaks through the roof tiles, generally associated with other damage to rafters and purlins.
- Detachment of joggled and wedged scarves in the tie beams, of no consequence thanks to the reinforcement in all the trusses affected.

2.1.2 Structural configuration

The roof over the church comprises in a single structure what would appear to be two different systems. On the one hand, a completely symmetrical wood frame adjusted to the shape of the church regularly follows the pattern of the cross vaults in the central nave only, inasmuch as the roofs over the side chapels are separate structures positioned at a lower elevation. This frame consists in Spanish trusses (i.e., in which the joints rest on the tie beam) whose tie beams are reinforced. And on the other hand there is a series of wood members comprising a necessarily asymmetrical structure built over top of the Spanish trusses, raising the roof and enlarging its span to cover a larger area.

2.2 Roof over the San Carlos Square wing

2.2.1 Structural members: condition

In this area has the roof covers a usable chamber connecting the wing to the roof over the church. As in the case of the church, this chamber appears to be the result of enlarging an earlier roof.

Examination of the wood frame in this area was largely obstructed by the existence on the inner side of the chamber of roof framing and sheathing, part of a previous roof, which conceals the lower frame of the present roof almost entirely. The sheathing, however, is essentially flat and the present structure, where exposed, was found to be in good condition.

2.2.2 Structural configuration

The structural layout in this area is similar to the arrangement described for the church: i.e., there are indications of the existence of a previous roof with a smaller span, reinforced here by the presence of framing and sheathing that serve no apparent purpose. Consequently, as in the roof over the church, here the structure consists in a framework with (supposedly) symmetrical geometry supporting members added later to enlarge the area covered by the roof.

This duality in the structural configuration is reinforced by the appearance, inside the chamber underneath the present roof, of what was once a cornice on the church. Of the two framing systems, the symmetrical structure covering the church nave is identified to be the more authentic, and in fact bears the load imposed by the structure underpinning the part of the roof that was built as a merely utilitarian enlargement.

3 RESTORATION PROPOSAL

After the survey conducted and in keeping with a philosophy that places a premium on essential aspects such as recovery of church roof symmetry and the upper windows for natural lighting, both of which are sufficiently documented to be original features, the approach chosen is to eliminate subsequent additions of questionable value that contradict and detract from fundamental characteristics of the monument's architecture (Figs 4 and 5).

Moreover, the restitution of the lighting in the central nave will enhance the perception of San Carlos Church interiors, a stylistically harmonious work of Baroque decorative art undertaken in the eighteenth century.

3.1 Justification of the solution adopted

The solution proposed consists in restoring the roof to its original configuration, i.e., eliminating the enlargement that affected the two parts of the roof described above. This will leave part of the building, namely the presently usable chamber, unroofed. The most reasonable element for the area would appear to be a flat roof, to conserve the visibility of the cornice from the cloister.

Such a tactic also provides natural lighting for the central nave of the church by exposing the upper windows in this area, presently concealed underneath the existing roof. To this end, skylights or an "English basement"-type arrangement will be used to eliminate any obstacle preventing daylight from reaching these windows (Fig. 5).

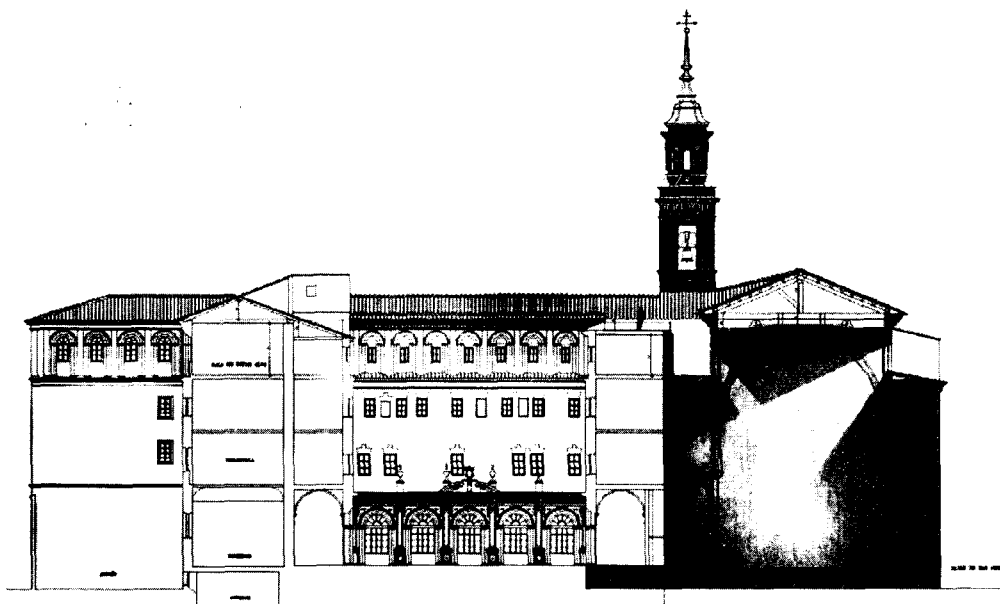


Figure 5 : Proposal for restitution of the natural lighting inside the church by rehabilitating the windows on the south or epistle side.

3.2 Restoration work to be performed

The work to be performed on the roof under this proposal would include at least the following:

- Removal and recovery (50%) of the existing roof tiles
- Removal and total forfeiture of the roof sheathing, including the clay or mortar underlayer
- Dismantling of the wood elements used in the enlargement for possible reuse to replace or reinforce damaged wood in other areas
- Rehabilitation of the wood to be conserved, replacing the damaged pieces (30%); reinforcement as required; sanding off all unhealthy wood; and protection against xylophages and rot.
- Examination of bore samples of truss supports embedded in walls. At least 10% of the supports will be sampled. If a single support is found to be impacted, all the rest will be exposed. Restoration of damaged supports, as appropriate, following the principles of rehabilitation, consolidation, bonding and ventilation.
- Installation of new roof sheathing protected with bitumen and laying of roof tiles in mortar.

4 CONCLUSIONS

The conclusion reached in both the historical study and the pathological survey of the roof is that the present configuration on the south side does not conform to the original church design. Alteration of that design intensified the partial buckling of some of the principal rafters on the gospel side (side of the truss overlooking San Jorge Street) due to the added compression force transmitted to the structure; eliminating this enlargement will restore the symmetrical geometry of the central nave, which differs from the roof framing over the lateral chapels. This solution will also restore the natural lighting inside the church, the initial aim of the study.

REFERENCES

- Abbad Ríos, Fco., 1942, *La iglesia y convento de San Carlos en Zaragoza*, Sociedad Española de Amigos del Arte Journal, 1st. quarterly.
- Ansón Navarro, A., 2001, curator of "*Zaragoza en la época de Baltasar Gracián*" exposition Palacio de Montezumo, November 2001- January 2002, Saragossa City Council.

- Álvarez, P. Gabriel, *Historia de la Provincia de Aragón de la Compañía de Jesús*, version of nineteenth century. Tomo 2º, Libro IV Chapter 54. *Colegio de iglesia de Zaragoza*.
- Boloqui, B., 2001, *El colegio de la Compañía de Jesús en Zaragoza en el que vivió Baltasar Gracián. Apuntes para su historia desde su fundación (1570-1599)*, in "Zaragoza en la época de Baltasar Gracián".
- Braun, J., 1913, *Spanien Alte Jesuitenkirchen*, Freiburg, pp 40-41.
- City Council of Saragossa, s/f, *Catálogo de la Iglesia del Real Seminario de San Carlos*, triptych, Saragossa.
- Sale, G., editor, 2003, collaboration of Civiltà Católica, *Ignacio y el Arte de los Jesuitas*, Bilbao, El Mensajero.
- Torralba, F., 1952, *Real Seminario de San Carlos Borromeo de Zaragoza*, Instituto Fernando El Católico, Saragossa.
- Valléry Radot, J., 1970, *Le recueil de plans d'édifices de la Compagnie de Jesús conservé a la Bibliothèque Nationale de Paris*, Institutum Historicum S. J. (IHSI), Rome.
- Valero, J. Mª, 2005, Report of facades restoration and roofs rehabilitation of Old Seminary of San Carlos, Saragossa.